

New Abstract

Please replace the current Abstract with the following Abstract.

A multiplexer/demultiplexer is provided for optical interconnection between electronic components on an integrated circuit chip. The multiplexer/demultiplexer includes a substrate formed with an array of photo emitters/detectors and conditioning electronics coupled thereto. A first layer of optically transparent material is formed on the substrate overlying the emitters/detectors and a second layer of optically transparent material, functioning as an optical waveguide, is formed on the first layer. A binary blazed grating is formed at the interface of the two layers. For multiplexing, discrete wavelength optical signals are modulated with data, emitted by the emitters, intercepted by the binary blazed grating, and multiplexed into a polychromatic beam for transmission through the waveguide. For demultiplexing, the discrete wavelengths are separated by the binary blazed grating and directed to corresponding detectors. The conditioning electronics receive and demodulate the output of the detectors to extract data, and format the data for communication with electronic components.